Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for closed loop control in chemical mechanical polishing using an inline metrology station, comprising:

measuring, at a metrology station, a dielectric thickness in an array for each of a plurality of arrays of a first wafer ~~from~~ of a plurality of wafers ~~at a metrology station~~;

determining at least one polishing parameter from the ~~dielectric thickness in the array of the first wafer~~ measured dielectric thicknesses so that a uniformity of metal feature thicknesses is increased with subsequent polishing, the determining being based on a model in which a thickness of a metal feature in an array is proportional to a dielectric thickness in the array; and

polishing a subsequent wafer from the plurality of wafers using the polishing parameter.

2. (Original) The method of claim 1, further comprising:

measuring a dielectric thickness in a field of the first wafer.

3. (Original) The method of claim 2, wherein:

determining the at least one polishing parameter includes using the dielectric thickness in the field of the first wafer.

4. (Original) The method of claim 2, further comprising:

determining a measurement of erosion, where the measurement of erosion is a difference between the dielectric thickness in the field and the dielectric thickness in the array; and

wherein determining the at least one polishing parameter includes using the measurement of erosion.

5. (Original) The method of claim 1, wherein:

determining the at least one polishing parameter includes approximating an optimal solution under a plurality of constraints with reference to which a predicted metal feature thickness uniformity is maximized in a subsequent wafer from the plurality of wafers.

6. (Canceled)

7. (Original) The method of claim 1, further comprising:

passing the dielectric thickness measurement to a controller.

8. (Original) The method of claim 7, further comprising:

passing the polishing parameters to a chemical mechanical polishing apparatus.

9. (Original) The method of claim 1, further comprising:

measuring barrier layer residue thickness and determining the at least one polishing parameter from the dielectric thickness and the barrier layer residue thickness.

10. (Original) The method of claim 1, wherein:

determining the polishing parameter includes using the measurement of dielectric thickness in the array to approximate an optimal solution under a plurality of constraints with reference to which a predicted copper feature thickness uniformity is maximized and a difference between a predicted copper feature thickness and a target copper feature thickness is minimized.

11. (Currently Amended) The method of claim 1, wherein:

the polishing parameter includes at least a polishing time or a pressure of a chamber in a carrier head.

12. (Original) A method for closed loop control in chemical mechanical polishing using an inline metrology station, comprising:

measuring at a metrology station metal feature thicknesses at multiple points across a first wafer wherein the first wafer is one of a plurality of wafers;

calculating at least one polishing parameter using the measurements of the metal feature thicknesses of the first wafer that approximates an optimal solution under a plurality of constraints with reference to which a predicted metal feature thickness uniformity is maximized in a subsequent wafer from the plurality of wafers; and

polishing the subsequent wafer from the plurality of wafers using the at least one polishing parameter.

13. (Currently Amended) The method of claim ~~11~~ 12, wherein:

measuring includes measuring with an acousto-optical metrology device.

14. (Currently Amended) The method of claim ~~11~~ 12, wherein:

measuring includes measuring with a non-contact optical metrology device.

15. (Currently Amended) The method of claim ~~11~~ 12, wherein:

measuring includes measuring the metal feature thicknesses in a plurality of dies at different radial positions from a center of the wafer.

16. (Currently Amended) The method of claim ~~11~~ 12, wherein:

the plurality of constraints includes minimization of a predicted erosion in a subsequent wafer.

17. (Currently Amended) The method of claim ~~11~~ 12, wherein:

measuring the metal feature thicknesses includes measuring copper feature thicknesses.

18. (Currently Amended) The method of claim ~~11~~ 12, wherein:

the at least one polishing parameter includes a polishing time or a pressure of a chamber in a carrier head.

19-21. (Canceled)

22. (Currently Amended) A method for closed loop control in chemical mechanical polishing using an inline metrology station, comprising:

measuring a first dielectric thickness in a first array of a first wafer at a metrology station;

measuring a second dielectric thickness in a second array of the first wafer at the metrology station;

passing the first and second dielectric thicknesses from the metrology station to a controller;

~~determining in~~ operating the controller to determine at least one polishing parameter ~~in the controller using the first and second dielectric thicknesses~~ from the measured dielectric thicknesses so that a uniformity of metal feature thicknesses is increased with subsequent polishing, the determining being based on a model in which a thickness of a metal feature in an array is proportional to a dielectric thickness in the array; and

polishing a subsequent wafer with the at least one polishing parameter.

23. (Canceled)

24. (Original) A method for closed loop control in chemical mechanical polishing using an inline metrology station, comprising:

measuring at a metrology station metal feature thicknesses at multiple points across a first wafer wherein the first wafer is one of a plurality of wafers;

calculating at least one polishing parameter using the measurements of the metal feature thicknesses of the first wafer that approximates an optimal solution under a plurality of constraints with reference to which a difference between a predicted metal feature thickness and a target metal feature thickness is minimized; and

polishing a subsequent wafer from the plurality of wafers using the at least one polishing parameter.

25-34. (Canceled)

35. (Currently Amended) A method for closed loop control in chemical mechanical polishing using an inline metrology station, comprising:

measuring, at a metrology station, a metal feature thickness in an array for each of a plurality of arrays of a first substrate ~~from~~ of a plurality of substrates ~~at a metrology station~~;

determining at least one polishing parameter from the ~~metal feature thickness in the array of the first substrate~~ measured dielectric thicknesses so that a uniformity of metal feature thicknesses is increased with subsequent polishing, the determining being based on a model in which a thickness of a metal feature in an array is proportional to a dielectric thickness in the array; and

polishing a subsequent substrate from the plurality of substrates using the polishing parameter.

36. (New) The method of claim 24, wherein:

measuring includes measuring with an acousto-optical metrology device.

37. (New) The method of claim 24, wherein:

measuring includes measuring with a non-contact optical metrology device.

38. (New) The method of claim 24, wherein:

measuring includes measuring the metal feature thicknesses in a plurality of dies at different radial positions from a center of the wafer.

39. (New) The method of claim 24, wherein:

the plurality of constraints includes minimization of a predicted erosion in a subsequent wafer.

40. (New) The method of claim 24, wherein:

measuring the metal feature thicknesses includes measuring copper feature thicknesses.

41. (New) The method of claim 24, wherein:

the at least one polishing parameter includes a polishing time or a pressure of a chamber in a carrier head.